



## **Warm Season Annual Forages Sorghum, Sudangrass, Millet**

Compiled by\*: Paul V. Dixon  
MSU Extension Agent / Yellowstone County  
Room 106 County Courthouse, P.O. Box 35021 Billings, MT 59107  
Phone: 256-2828 – e-mail: [pdixon@montana.edu](mailto:pdixon@montana.edu)

“Warm season” forage crops such as sorghum, sudangrass, sorghum/sudangrass hybrids and millets can provide an excellent forage source for Montana agricultural producers. During the past several years Yellowstone County producers have been very successful in utilizing these forages.

These forage crops must be seeded after soil temperatures are consistently above 60 degrees Fahrenheit. This can prove to be an advantage in Montana, because by mid- to late May we have a better idea of the seasonal moisture situation for perennial pastures and hay ground, plus farming workload can be distributed. After establishment, warm season forages can be very productive on dryland. Compared to small grain forages, warm season forages generally yield more forage per inch of soil moisture. Depending on moisture, warm season forages can yield 1.5 to 6 tons of dry matter per acre.

### **STAND ESTABLISHMENT**

Planting into a firm, mellow, moist seedbed is important for optimum production. For dryland production of forage sorghum and sorghum/sudangrass, seed on wide rows (21 to 28 inch) with 5 to 8 pounds of seed per acre. Sudangrass can be drilled or broadcast at a seeding rate of 25 to 30 pounds per acre. Under irrigation, the seeding rates should be increased to optimize forage yield and quality. Seeds should be planted one to 1.5 inches deep. Millet should be planted at a rate of 15 to 20 pounds per acre if solid seeding or broadcasting. Seed 7 – 10 pounds per acre if drilled into 30 – 42 inch rows. Heavier seeding rates should produce finer stems.

### **FERTILIZATION**

No current fertilization recommendations have been generated for Montana, but a good guideline is to supply about 20 pounds of Nitrogen (soil test plus fertilizer) for every ton of anticipated yield. Under irrigation where a 6 ton per acre yield is expected this would mean supplying 100 to 125 pounds of N pre-plant incorporated and another 40 pounds top dressed on the regrowth. Phosphorus and potassium requirements are similar to those of small grains.

### **FORAGE HARVESTING**

Sudangrass and millet provide a wide range of alternative uses when utilized as an annual forage. They may be cut for hay, haylage, silage, green-chop or pasture. Forage sorghum was developed from grain sorghum and is suitable for silage, but not for dry hay production. There are a number of sorghum/sudangrass hybrids available—these are very high-yielding, and combine the leafiness and regrowth ability of sudangrass. These hybrids are excellent for silage or fall pasture, but not for dry hay.

## **FEEDING PRECAUTIONS**

### **Prussic Acid**

The young leaves and shoots of forage sorghums, sorghum-sudangrass hybrids and sudangrass contain a high level of glucoside which can release prussic acid (HCN), or hydrogen cyanide, when ingested by livestock. Generally, when forage sorghums have reached a height of 20 – 24 inches, the relative percentage of HCN is low enough that the forage is safe to pasture or greenchop. The regrowth after cutting or after a frost is very high in HCN because it is essentially all new leaves and shoots. The risk of possible prussic acid poisoning can be reduced by following the following precautions:

1. Do not graze or greenchop until plants are 20-24 inches in height.
2. If stunted by drought or other conditions, do not graze or chop until the crop has recovered and reached the 20-24 inches in height.
3. Do not pasture following a closely cut hay or greenchop harvest.
4. Avoid pasturing sorghums immediately following a frost or freeze that does not completely kill plants due to new shoot regrowth.
5. Do not graze or greenchop for at least 5 days following a killing frost or until all growth has turned brown and no new regrowth occurs.
6. Apply phosphorus and potassium fertilizers according to soil test.
7. Avoid excessive application of nitrogen fertilizer. High rates of N-fertilizer with low soil phosphorus have doubled the prussic acid content of young leaves.

NOTE: Millet is not at risk for prussic acid toxicity.

### **Nitrate**

The nitrate content of forage sorghums, sorghum/sudangrass, sudangrass and millet can be high depending on growing conditions. The risk of nitrate poisoning can be reduced by following the following precautions:

1. Avoid grazing or harvesting after periods of drought, hail or frost.
2. Harvest only the upper  $\frac{3}{4}$  of the plant. Nitrates accumulate in the lower part of the stem.
3. Utilize the crop as silage. The ensiling process reduces the nitrate content.
4. Apply nitrogen fertilizer according to moisture availability and yield potential.
5. Harvest high-nitrate forage in the afternoon or evening hours after the crop has received several hours of sunshine. Avoid harvesting on especially cloudy, overcast mornings.
6. Never turn hungry animals out to pasture in possible high nitrate content crops. Always feed a low-nitrate roughage prior to entry to reduce initial intake.

NOTE: The Yellowstone County Agent can provide a qualitative nitrate “QuickTest” on a representative sample prior to being cut or grazed. If possible, a quantitative nitrate lab test is recommended before feeding at-risk forage.

\*Compiled Fall 2001 from the following sources: “Sorghum and Sudangrass as Montana Forages” Cash and Schuldt, MSU Extension and “Pearl Millet: Forage Production in North Dakota” R-1016, Sedivec and Schatz, NDSU Extension.